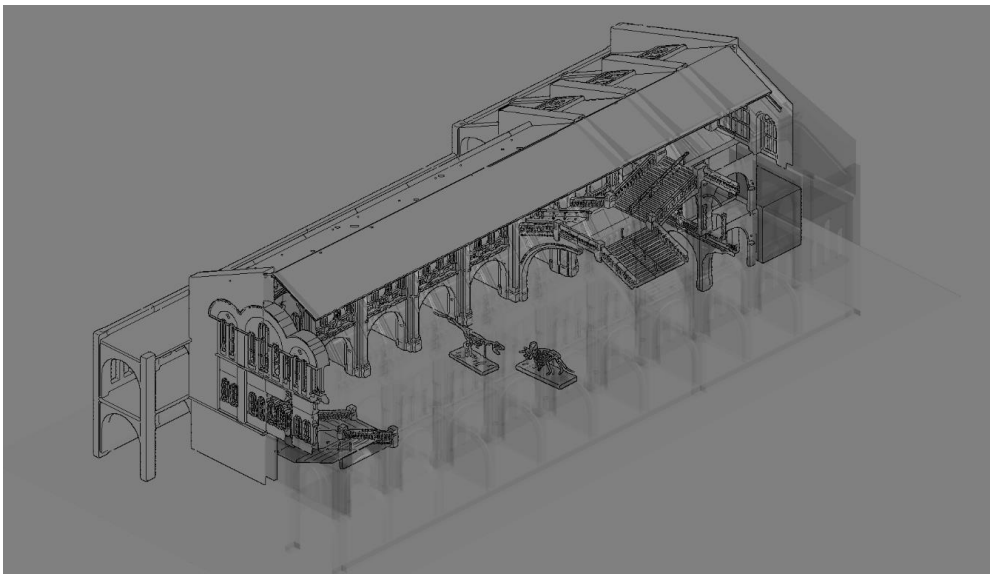
Weekly report (2013.7.1 ~7.7)

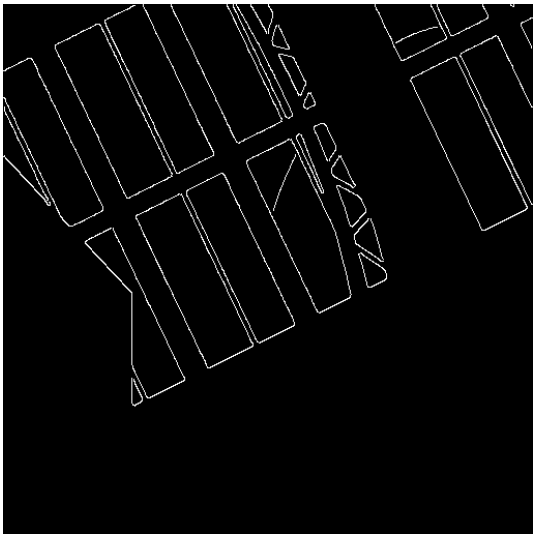
Done

1) Add edge detection as a web application. This edge detection makes use of normal, depth and object number information, thus making it better. Some of the results is shown below.

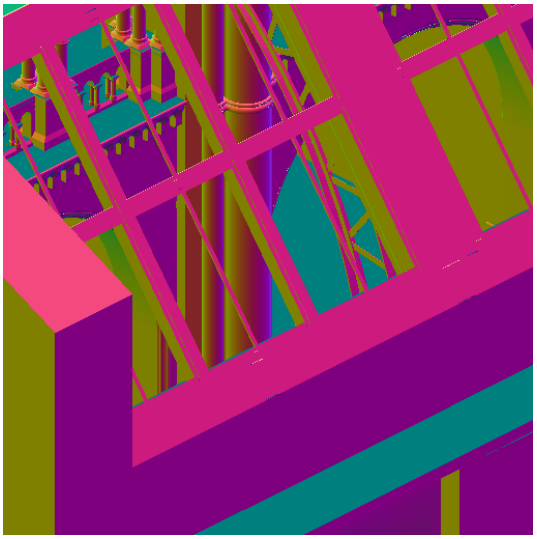


a) an overview

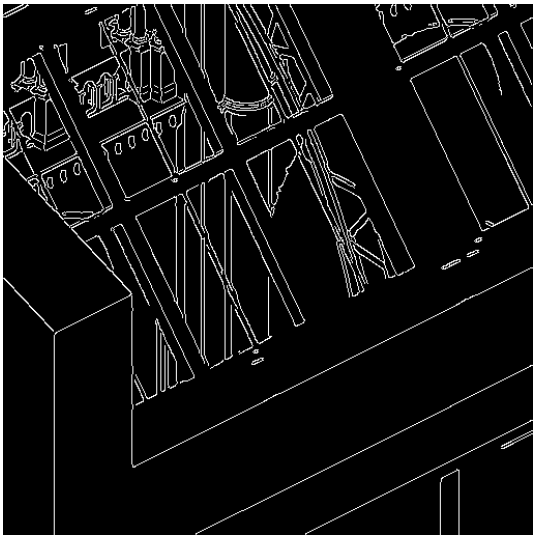
b) depth



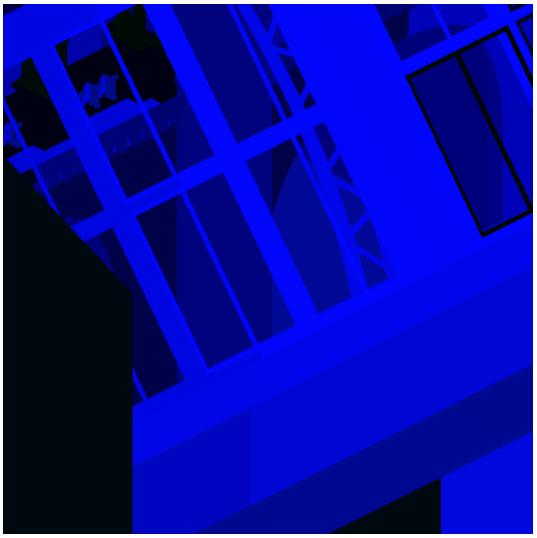
c) depth edge



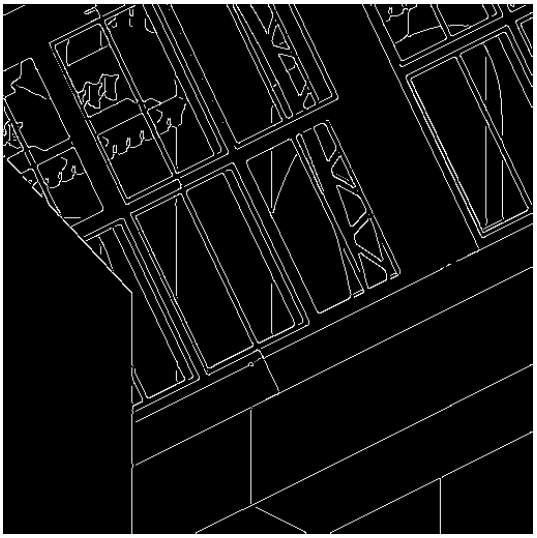
d) normal



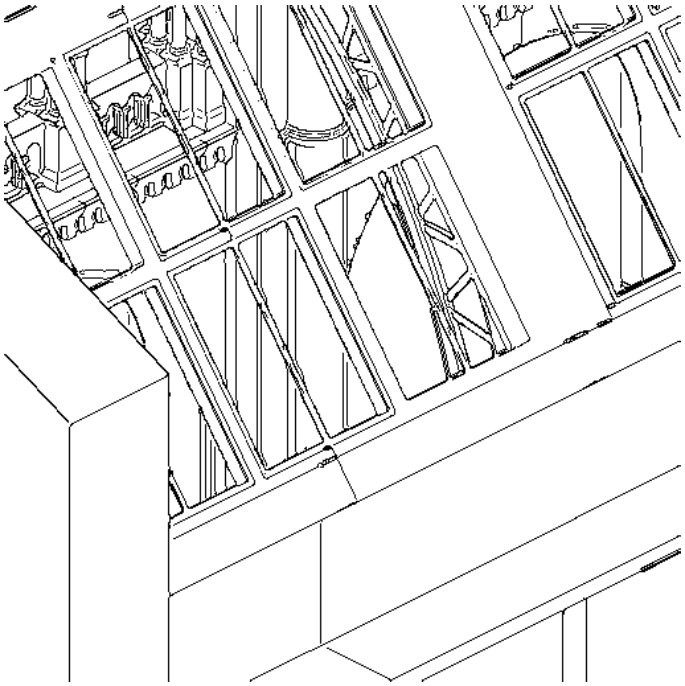
e) normal edge



f) object number



g) object number edge



h) final edge of segment 168

2) reading papers about parallel visualization.

"An Introduction to Parallel Rendering": a review of parallel rendering, though it's a paper more than ten years age(1997), the problems it illustrates that exist in parallel rendering, such as load balancing, task and data decomposition and coherence, still occur in modern parallel system and much attention should be paid.

"A sorting classification of parallel rendering": sort parallel rendering according to where the sort from object-space to screen-space occurs, and perform a coarse analysis of the aggregate processing and communication costs of each and identify constraints they impose on the rendering application. In the "hybrid method" I implemented last week, it's also a problem of where to perform sorting. It is also importance for making tradeoffs in the parallel rendering system.

"A Parallel Visualization Pipeline for Terascale Earthquake Simulations": It's a system similar to our target. It implemented volume rendering and LIC to visualize large-scale time-varying data of earthquake. The main idea is to overlapping I/O and rendering, thus making data I/O "free" and the frame-rate only relies on the rendering cost.

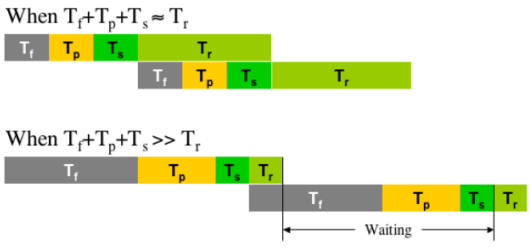


Figure 5: Overlapping I/O and rendering calculations. Only when I/O time is not larger than the rendering time can we effectively hide the I/O cost.

I just made a general understanding of real-time parallel visualization by reading these papers. And it's far from implementing a whole parallel system. Haidong has suggested that

we can start from an open-source project:” Equalizer”, I’m still reading its paper.

To Do

1) Writing a draft for my work in Chinese.
2) After reading the paper about “Equalizer”, discuss with haidong and make a preliminary target to fill.